OSMP Leave No Trace Report

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Leave No Trace:
Pilot Project Report

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1. EXECUTIVE SUMMARY

BACKGROUND

The following report summarizes the focus group, contact logs, and follow-up survey analysis of the "Leave No Trace on Open Space" educational program. Program partners are Leave No Trace, Inc. and the City of Boulder (Colorado) Open

Space Program. It is the first "front country" program for Leave No Trace, Inc.The program was designed for rural day use recreation. City of Boulder Open Space receives about 1.7 million visits a year on 80 miles of designated trail. These trails are on 29,000 acres of sensitive and ecologically rich land. The Open Space Program has for years used minimum impact education as one management tool. Increasing recreational use made a program focused on leave no trace principles essential. Objectives - The pilot program had three objectives:
Educate frequent visitors about ways to reduce impacts to each other and the natural world through low impact practicesInform community opinion leaders about the programTest and improve the program by conducting a pilot project and systematically gauging effectiveness through a focus group, contact logs, and a follow-up survey Process - The project began by drafting a minimum impact message and principles based on high-priority management challenges. A focus group of visitors who visited Open Space at least once a week was used to evaluate the program and to refine the message. Extensive education and outreach efforts for the pilot project were conducted in the South Boulder Creek Management Area from late August through mid November 1998. The program was based on focus group results and recreation behavior research literature. Personal trailhead contacts were made at four high volume locations including Bobolink, Dry Creek, and Cottonwood Trailheads and a major access on South Boulder Creek Trail. Personal contacts were reinforced with brochures, signs, small posters posted on information boards, educational programs, municipal access channel broadcasting (Channel 8), news articles, interpretive programs, and limited mailings. Contact logs were used to record the number and activity of visitors, visitor awareness of the leave no trace concept, whether the visitor took the brochures, and the educator’s perception of visitor interest. The final phase of the program was an intercept survey administered at the same four trailheads where personal contacts were made. The survey was conducted over a six-week period from January to mid February 1998. Over 630 randomly selected participants were surveyed--half of which had heard of the program and half of which who had not heard of the program--with wide ranges in age, education level, activity, and frequency of use. OUTREACH PROGRAM
A total of about 1,700 trailhead contacts were made.
Brochures were offered with the trailhead contact, placed in information board dispensers, and distributed throughout the City and at various events.
Signs cut out in the shape of an "icon" representing each of the six principles were posted at the four trailhead locations separate from information boards and were rotated every two weeks.
Small posters were placed at three trailhead information boards.
Two mailings to 300 community opinion leaders were sent.
News releases generated four articles in local media.
A three-minute spot was run six times a week in September on the local municipal access channel (Channel 8).
Two interpretive programs were held. FOCUS GROUP RESULTS
Four focus groups were conducted, one each, among the following populations: runners, walkers and hikers, dog walkers and equestrians, mountain bikers, and opinion leaders of local environmental and recreation groups
Support for a minimum impact program was virtually unanimous. Visitors have strong and positive feelings about their Open Space activities and areas they use. Both are important to their lives. Educational and promotional efforts should recognize and leverage these relationships in order to attract and engage visitors.
Visitors believe that Open Space areas are in good condition. It would be difficult to motivate visitors based on arguments that Open Space is not in good condition. Education would likely be more successful if centered on the idea of protection and maintenance of current conditions. This approach would better fit into existing beliefs that current conditions are good, that open spaces are under pressure, and that it is important to preserve open spaces.
The five suggested principles were widely approved (travel on trail, pick up poop, manage your pet, take out trash, leave it as you find it). Two additional principles were suggested. One related to user interactions, the other concerned wildlife interactions. A user interaction principle was added (share the trail) and the wildlife concerns were incorporated into the first five principles.
The work of the Open Space Program is valued, but some disagreement was expressed about policy. One perception was Open Space protection was favored over recreation. This disagreement is not likely to have a strong negative effect on the program however, because leave no trace principles are congruent with people’s beliefs. The phrase and theme of leave no trace are widely recognized, although the existence of the Leave No Trace, Inc. organization is not well known. Using the leave no trace theme and concepts fosters quick recognition and adds credibility to the educational program.
Two different versions of the program name were tested: Do the Wild Thing: Leave No Trace on Open Space and Leave No Trace on Open Space. Opinions were mixed. "Do the Wild Thing" was viewed as being more positive, fun, and catchy. Others considered the "wild thing" as connoting wild, irresponsible behavior and inconsistent with the program’s message. "Leave No Trace on Open Space" was seen as making the point, but in a boring way.
Representations of a Coyote Bob mascot were tested. People seemed to be able to relate best, on a personal level, to the more "humanized" coyote of the hiker, but not to the cartoon like coyote.
Several message styles were assessed to see what participants thought would be the most appropriate and effective. Many found the relaxed style was more comfortable and friendly. A direct style came across to some as straightforward and more mature, and to others as dry and directive. A more relaxed style was used in an attempt to make the program more fun and easy to relate to.
Message delivery options were also tested. Delivering a message while a person is engaged in his or her activity (at the trailhead) was seen as most effective. Rangers/guides, signs, and handouts were also considered useful. Newspaper articles were viewed as appropriate, particularly articles relevant to their interests. The program was designed around reinforcing the personal trailhead contact, a technique also found effective in recreation behavior and persuasion research. CONTACT LOG RESULTS

About 1,700 people were contacted. Of these 1,450 initial contacts and 170 re-contacts were analyzed. About 80 contacts were not included in the analysis due to inaccurately recorded information. Staff and volunteers worked 91 contact hours, averaging 17.8 people contacts per hour.
The busy Bobolink Trailhead had 56% of the contacts, followed by Dry Creek with 14%, Cottonwood at 12%, South Boulder Creek at 10%, and Mount Sanitas at 9%. (Mount Sanitas was not in the pilot area, but included because of the perceived need for Leave No Trace education.
Dog walkers constituted 32% of the contacts, closely followed by hikers with 30%, joggers at 20%, bikers at 16%, and other user activities at 2%. Dry Creek had twice the percentage of dog walkers when compared to any other trailhead with 78%.
Interest in a leave no trace ethic was perceived as high, suggesting a receptivity to the educational program and the potential to change behaviors. Only 1 in 5 visitors was not interested, with 2 of 5 showing mild interest, and 2 of 5 being either interested or very interested.
The second indicator of interest is the 82% of visitors who accepted the Leave No Trace on Open Space brochure. Visitors took the brochure at Dry Creek 89% of the time, Bobolink and Mount Sanitas 86%, South Boulder Creek 73%, and Cottonwood 65%. Dog walkers took the material 85% of the time, hikers 83%, bikers 78%, joggers 74%, and equestrians 67%.
Visitors more aware of leave no trace ethics were less likely to accept the materials (92% versus 74%). This may indicate that it may be more difficult to educate more knowledgeable people about new leave no trace concepts because they understand some of the concepts. SURVEY RESULTS
Knowledge was gauged with a five question series of true and false questions about the information found in the brochures, posters, and signs and delivered through staff trailhead contacts and programs. Visitors were then asked if they had heard of the Leave No Trace on Open Space program. If they had not, they skipped to the demographic questions for comparison. Those aware of the program were asked to rate the effectiveness of seven outreach mechanisms on changing behavior on a scale of "1 to 5" "1" being highly effective, and "5" being highly ineffective. Behavioral intent was measured by asking the participants to rate their likelihood of practicing the six principles. The survey solicited the public’s input and suggestions to improve the program and concluded with a series of demographic questions.
Of 633 surveyed, 320 had heard and 313 had not heard of the program. The margin of error for 633 is +/- .04 and when 313 or 320 are used independently it is +/- .056). Compared to the log results, there was at least a 17% increase in awareness of leave no trace in the pilot area after the outreach program. When first contacted only 33% of visitors knew about the general concept of leave no trace based on log results. This compares to 50% awareness of the more specific Leave No Trace on Open Space program on the follow-up survey.
Survey results showed dog walkers to be more aware of the Leave No Trace on Open Space program (65%), frequent visitors (3+/wk) had a 60% awareness of the program. Those visitors 65 years and older were 54% aware of the program. Fifty-four percent (54%) of those with some college had a higher awareness of the program than other visitor education levels.

People who visited the pilot area were mostly female (56%), 25 to 44 years of age (54%), and well educated (74% college degree or advanced degree). Dog walking (36%) and hiking (26%) were their primary activities, with running (20%) and biking (16%) close behind. They are an active bunch: 58% visited Open Space three plus times a week, while only 4% visited less than once a month.
Bobolink Trailhead accounted for 58% of the contacts (similar to the contact logs), Dry Creek had 19%, Cottonwood 16%, and South Boulder Creek Trail south of South Boulder Road 7%. Zip codes help identify generally where people come from: 71% Boulder (43% from the pilot area) and 15% Lafayette/Louisville.
About 25% of the participants aware of the Leave No Trace on Open Space program were contacted at the trailhead, 20% learned of the program through the information boards, 15% through newspapers, 10% by signs, 9% by word of mouth, and 9% learned of the program in other ways. The sign percentage is artificially low because the signs were placed mid-way through the program.
Most people thought the trailhead contacts were most effective (55% highly effective), followed by signs (32%), word of mouth (26%), information boards (24%), newspaper (13%), mailing (18%), and Channel 8 (8%).
Knowledge levels of visitors who had heard of the Leave No Trace on Open Space program were higher than knowledge levels of visitors who had not heard of the program. Increasing knowledge levels, in addition to changing behavior, was a primary objective of the program. Based on an index of a five true/false knowledge questions, there was a statistically significant knowledge difference between those who had heard about the program and those who had not. A mean of 3.43 correct responses was found for those aware of the program, compared to 2.9 correct responses for those not aware of the program. *Statistically significant difference.
Results for each true/false knowledge question are listed below. Those who were aware of the Leave No Trace on Open Space program are listed first, followed by those who were not aware. An * denotes a statistically significant difference between the two: orange peels taking several years to decompose--66% to 47%*, dog poop increasing nitrogen thus favoring weeds--36% to 30%, collecting leaves is OK--93% to 83%*, walking through mud--89% to 87%, and trail activity impacts birds 100 yards from trail--60% to 51%*.
Increased knowledge levels of visitors who had heard of the program can be demonstrated another way. A greater percentage of visitors who had heard of the Leave No Trace on Open Space program could correctly answer at least four of the five knowledge questions, than visitors who had not heard of the program. Of those who had heard of the program,

52% answered at least four questions correctly, compared to 37% of those who had not heard of the program. Runners had 51% with four or more answers correct, bikers 46%, hikers 43%, and dog walkers 41%.
Only people who had heard of the program were asked about their intent to change behavior, so a comparative analysis could not be made. Intuitively, given the increase in program awareness and knowledge level, an increase in behavioral intent may have occurred as well. For those who heard of the program, 95% said they were very likely to practice trash your trash principle, 90% leave it as you find it, 88% share the trail, 86% manage your dog, 79% stick to trail, 78% pick up poop.
Program improvement suggestions made in an open-ended question were primarily for increased education and outreach efforts with 34%. Enforcement and patrol efforts accounted for 14% of the suggestions and 15% were related to dog management.
Trailhead contacts (77% effective), signs (65%), information boards (59%), and word of mouth (50%) were those mechanisms thought to be most effective by the 320 people who had heard of the program. Newspapers (37%) and Channel 8 (17%) were thought to be less effective.

RECOMMENDATIONS

Based on the success of the pilot program the Leave No Trace on Open Space program should be implemented throughout Open Space. Pilot program research shows that:

(1) awareness of Leave No Trace on Open Space program increased at least 17% in the pilot area,

(2) knowledge levels of those who had heard of the program were significantly higher than those who had not, and

(3) there is a good chance that some behavioral change took place. Minimum impact education is a fundamental management tool. The Leave No Trace on Open Space program, albeit in need of refinement, has proven effective. A cautionary note: Because values, beliefs, and attitudes are so deeply held and the education process is so complex, marketing research has shown that a very successful program shifts only 5% of a target audience's behavior (Mendelsohn 1973).

The following education process illustrates the complexity and sequential nature of changing behavior:

(1) someone needs to be exposed to the information,

(2) then they need to attend to the new information,

(3) they need to be open and receptive to thinking about it,

(4) then it is interpreted so it makes sense to them both through thought and feeling,

(5) the information is then compared and integrated (or not) into a person's knowledge and experiences, and finally, if all these things occur, and

(6) an action takes place.

This information illustrates three things:

(1) Education is incremental and it takes concerted and prolonged effort to change attitudes, let alone behavior. One has to only look at the littering campaigns to understand the generational timeframes required to shift predominate attitudes.

(2) Education is most effective at addressing uninformed and unskilled actions and much less effective at addressing

uncaring or illegal actions.

(3) Education does not replace the need for other visitor management actions that may be required in an area to maintain recreational experiences and to protect wildlife.

Education Approach

Because of the objective of instilling a leave no trace ethic, the "Central Route of Persuasion" will again be used. This approach uses information and logic to create long lasting change in attitudes and behavior. It also requires strong arguments, and that the receiver of the message be attentive, receptive, and willing to integrate the information with what they already know--something that is difficult to do. It is a "long-haul" proposition. In the "Peripheral Route of Persuasion" decision rules or superficial clues to change behavior (e.g., appearance) and change is usually short lived (just think of a beer commercial).

Source factors

Trailhead contacts by Public Information Coordinators and volunteer Trail Guides, identified by their Open Space shirts, will remain central to the program. Contacts will be upbeat with an interest expressed in the visitor's activity. Interest groups will continue to be featured prominently on materials. An endorsement campaign by prominent recreationalists will be considered.

Modeling behavior has been proven to be one of the most effective persuasion techniques. While staff may already perform low-impact practices, they will be asked to read the materials and be sure to model the behavior.

Receiver factors

Trailhead contacts will continue to be made, better ensuring that visitors take time to think about concepts, evaluate them, and hopefully incorporate them into their actions. The representative can tailor the discussion directly to the visitor's needs. The Leave No Trace on Open Space program will continue to focus on the frequent visitors because of their inordinate amount of use, although research indicates that behavior change is more difficult among people with higher knowledge levels because they have a variety of experiences to compare to what is recommended.

Because it is important that opinion leaders know about the program, they will continue to be a secondary target audience for the program.

Message factors

Language will be refined in light of research results. With all text, the strongest arguments will be used. The text will concentrate on what people do not know or are not skilled at (trail and off trail effects, orange peels, dog poop).

Channel factors

Program "look" - The Leave No Trace on Open Space program will continue with the "fun" graphic look with icons for each principle.

Trailhead contacts - Based on the assessment survey and other research, personal contacts will again be the focal point of the program, with brochures and signs used for reinforcement.

Signs - Signs will continue to incorporate the "icon" from the brochure, cut-out, single principle look. Signs will be continue to be rotated based on area needs. Placement of the signs will continue to be at trailheads separate from

information boards. A more permanent way to attach these signs will be used.

Information boards - Posters will again be used on information boards. A large banner reading "Please take the time to read these messages" will be placed across the top of the board to increase attention to all the materials placed on the board (as based on the Cole information board research results).

News coverage - News coverage will be sought. This includes two articles in the Boulder Daily Camera Get Out! Section, and one article in the other Boulder papers (targets or hooks?)

Video – A short Channel 8 video will be produced with a new voice over using available footage. The logo and icons will be integrated into the program. The video will be frequently run to fill in small airtime openings to reach opinion leaders.

Interpretive programs – Instead of specific Leave No Trace on Open Space programs, which were poorly attended, germane or the high priority principles will be incorporated into all interpretive/educational programs.

Mail – A kick-off announcement and a program announcement will be mailed to opinion leaders.

Research

Finally, a research program to further measure success of the program will be established. This will include improved contact log categories and a survey(s) to further gauge effectiveness and improve the program. The survey will be designed to gauge knowledge gain, behavioral intent change, and refinement of the educational factors listed above.

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2. INTRODUCTION

Recreational use of City of Boulder Open Space is dramatic. Residents of Boulder are very active. This city of 100,000 is primarily responsible for 1.7 million visits to City of Boulder Open Space (Open Space) a year. Visits take place on more than 130 miles of designated trail within more than 43,000 acres of sensitive and ecologically rich land. This much activity creates impacts to the natural environment that land managers have a responsibility to manage. At the national level "front country" use and impacts are increasing. A U.S. Forest Service study estimates about twice as many people participate in day hiking and developed camping than primitive camping and the growth of day hiking and developed camping are projected to be more than double that of primitive camping over the next twenty years (U.S. Department of Agriculture 1992). Land managers have a number of management options for recreational impacts. They generally fall into two categories: indirect and direct strategies (Hendee, J. C., Stankey, G. H. & Lucas, R. C. 1978). Indirect management strategies give the visitor a choice and include site improvements, education, or fees. Direct management actions generally do not give a person a choice and consist of enforcement, separating incompatible uses, rationing use, or restrictions.

A combination of strategies are often required to address site specific management issues. Surveys generally show that recreationists prefer educational strategies over more restrictive strategies. This preference often manifests as resistance to more "restrictive" management strategies, even when needed, when education is not included as part of a proposed solution.

For the Open Space Department it is important to proactively educate on minimum impact recreation as a "first choice action and use other management actions when needed. A pilot project was used to test the program on the City of Boulder Open Space's South Boulder Creek Management Area. The target audience was "frequent" visitors. Because people who visit open space at least once a week--frequent visitors--account for 85% of total Open Space visits, it was reasoned that this is most important and cost effective group to educate. Message and outreach mechanisms were based on management issues and focus group results that gauged knowledge level and needs of frequent visitors.

2.1 Objectives

The program had three objectives:

1. Educate frequent visitors about ways to reduce impacts to each other and the natural world through low impact practices

2. Inform opinion leaders about the program

3. Test and improve the program by conducting a pilot project and systematically gauging effectiveness through a focus group, contact logs, and a follow-up survey

2.2 The Partnership

To meet this educational need, the City of Boulder Open Space Department teamed up with Leave No Trace, Inc. (LNT) to establish a "Leave No Trace on Open Space" front country pilot program. LNT was aware of the growth projections for front country use and wanted to expand beyond their traditional back country focus. It is the first front county program for Leave No Trace, Inc.

2.3 Assessment Tools

To test ideas, gauge effectiveness, and refine the "Front country" pilot project three assessment tools were used: (1) a pre-education focus group, (2) trailhead contact logs, and (3) a follow-up assessment intercept survey.

Focus Group

This was held before the educational campaign began. The purpose of the focus group was to provide guidance on developing an effective communications strategy and distribution plan for reaching frequent visitors. To solicit a cross-section of views, four sessions were held consisting of hikers and runners, dog walkers and equestrians, mountain bike riders, and interest groups representatives.

Trailhead Contact Logs

This step recorded observations during the educational campaign. The primary purpose of the trailhead contact was to educate. Because of the education focus, only a few items were recorded in the contact log. The logs tracked number of contacts, awareness of Leave No Trace, and general interest.

Trailhead Intercept Survey

An assessment survey was used to measure progress after the educational campaign ended. The survey tested knowledge level of Leave No Trace on Open Space principles, perceptions of the programs effectiveness, and which outreach techniques were most effective.The results of these assessments are described below. A Timeline of events is attached as Attachment A.

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3. BACKGROUND

3.1 Principles

Leave No Trace on Open Space principles were selected based on pressing passive recreation management issues. Passive recreation activities include hiking, dog walking, running, bike riding, horseback riding, photography, and nature study. Listed below is a selected summary of research literature related to each principle.

Stick to Trail Focusing use on designated trails reduces impacts to wildlife. Passive recreation trails can negatively affect plants and animals in a variety of ways. The first is through habitat modification. Trails create "edge affects," an area that to the side of the trail that can impact individual, populations, and wildlife communities (Miller, S. C., Knight, R. L., & Miller, C. K, 1998). Focusing use on to designated trails, as opposed to a number of undesignated or "social" trails, reduces "edges" that fragment habitat. Off trail activity increases erosion and vegetation trampling (Kuss, F.R., Graefe, A.R., Vaske, J.R., 1990).Focusing use on trails, as opposed to off-trail activity, increases predictability for wildlife. The learned response of wildlife to human disturbance is either avoidance, habituation, or attraction (Knight, R. L. & Temple, S. A., 1995). These changes can adversely impact wildlife health and vigor. Increased predictability enables some wildlife to habituate to the activity (Knight, R. L, & Cole, D. N., 1995). In a study on Open Space, Knight and Miller found that there was an increased the response by western meadowlarks, vesper sparrows, and mule deer--all the species studied--to off trail activity by dogs and/or pedestrians (Knight, R. L. & Miller, S. C., 1996).

Share the Trail Research on conflict among recreationists has generally focused on intermixing of different recreation activities (activity style), tolerance for other lifestyles (tolerance for lifestyle diversity), use of a specific resource or area (resource specificity), and the intensity of focus participants have on their activity (mode of experience) (Jacob. G. R. & Schreyer, R. 1980). Literature has also examined crowding and found a relationship between perceived crowding (subjective measure of what "should be"), number of encounters (reported by visitor), and actual densities (number of people physically in a defined area) (Shelby, B., Vaske, J. C. & Heberrlein, T. A. 1989).

Trash Your Trash Disposing of trash helps keep the feeling of an area natural and reduces affects to wildlife from scavenging. It is not well known that even "biodegradable" scraps such as orange peels take several years to decompose. What is also not well known about are the indirect impacts to wildlife from scrap leavings. Leftover scraps increases the number of scavengers such as crows, magpies, robins, raccoons, and skunks near a trail which likely increases predation on other wildlife near the trail. Greater levels of nest predation have been found near habitat edges (Paton, P. W., 1994, Miller, S. C. et al, 1998).

Leave It As You Find It Taking artifacts and natural items diminishes the natural and cultural value of an area. "Wild crafting"--picking berries, mushrooms, herbs, and flowers--can negatively affect plants by reducing seed sources and the wildlife that depend on the plants. This is especially true when visits number in the millions.

Manage Your Pet Unmanaged pets can negatively effect other visitors outdoor experience and can be a safety issue. They can also harass wildlife, potentially making the wildlife less healthy by extending the zone of influence when off-leash, introduce disease, and generally disrupt the intricate web of ecosystem function. This impact is particularly acute in winter months and when birthing and raising young. (Sime, C. A.,1999)

Pick Up Poop Odor, unsightliness, and a hazard when walking--the negative effects of dog poop are self-evident. Poop and urine can also increase nitrogen levels in soils. This can shift the advantage away from native plants that evolved in nitrogen poor soils to non-native weedy species. Poop and urine can increase bacteria in streams and lakes.

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4. FOCUS GROUP RESULTS

4.1 Study Objectives The focus group objectives were: 1. Provide guidance for developing a communication strategy and communication executions that will be most effective in educating open space users and promoting the adoption of Leave No Trace practices. 2. Provide guidance for developing a distribution plan for reaching the target users.

4.2 Methods

Sampling

Participants were recruited at four trailheads during weekend days and weekdays. A series of questions was asked to screen for the target audience of frequent visitors--those that recreated on Open Space at least once a week. While these recreationists are 25% to 33% of Open Space visitors, they make up 85% of total visits. Questions were also asked to gain a mix of activity types, gender, and frequency of use.To discern any differences among activity types, four focus groups were held:
runners, walkers, and hikers,dog walkers and equestrians,mountain bikers,opinion leaders (representatives of local environmental and activity related groups)

An incentive of $10 was paid to participants. The focus groups were held on July 7 and 8, 1998 at the International Mountain Biking Headquarters in Boulder, Colorado.

4.3 Procedure

A consultant with a background in corporate marketing and research and outdoor recreation was retained to set study protocols and facilitate focus groups. (Billig, S. 1998) This report summary is either uses or paraphrases consultant’s executive summary. The sponsoring organizations were mentioned in the introduction, but participants were encouraged to freely express their views, good or bad. Questions were generally organized from the general to the specific and included a user profile, program objectives and message, the principles (guidelines), awareness of sponsoring organizations, and how that may effect the message, program name, mascot, message styles, and overall program support.

4.4 Results

General

In general participants had great attachment to their outdoor activity and responses often tended to be on the affective (emotional) level. Participants were supportive and were somewhat familiar with Leave No Trace principles, but often did not understand some the reasons for the principles. The principles tested were: travel on trails, manage your pet, pick up poop, take out trash, and leave it as you find it.

Program Support

Support of the program was virtually unanimous. While some had questions about its cost and whether it would compete for funds that would otherwise go to other favored programs (e.g., trail construction), virtually all felt that there was a need for the program and that the program would be valuable.

User Profile

Users of open space have extremely strong and positive feelings regarding the activities in which they are engaged and the open space areas they use. Both the activities and the open space areas are important to their lives. Educational and promotional efforts should recognize and leverage these relationships in order to attract and engage users. Users believe that open space areas are in good condition. In the view of users, there is no important "problem to be solved." If the objective of the program is to motivate people to change behavior, the campaign will need to take either one of two approaches.
If the reality is that open spaces are not in good condition, this reality needs to be communicated. It should be noted, however, that changing a market's beliefs is a difficult and expensive undertaking.The second approach is to center the campaign around the idea of protection and maintenance of current conditions. This approach would fit more comfortably into existing beliefs that current conditions are good, that open spaces are under pressure, and that it is important to preserve open spaces.

Program Objectives and Message

The Principles (Guidelines)

The five principles promoted by the program were widely approved. All were considered appropriate and important. A number of suggestions were offered to strengthen the content and presentation of the principles and are detailed in the report. Two additional principles were suggested.
User interactions were described as the most frequent problem faced in open space areas. Many favored its inclusion in the program.Wildlife interactions are briefly mentioned in one principle. Some felt the issue of wildlife interactions should receive much more attention. Specifically, there should be a principle about wildlife interactions. Awareness of Sponsoring Organizations and How That May Effect the Message

City of Boulder Open Space Department

Attitudes toward the Open Space Department are mixed. People value the work the department does and also disagree with some of its policies. The most important concern among many users is the perception that the Open Space Department favors protection of the open spaces over recreation. This disagreement is unlikely to have a strong negative impact on the program. Leave No Trace principles are already congruent with people's beliefs. People are already positively disposed to the objectives of the program. Still, some benefit would result from a more positive relationship between the Open Space Department and users.

Leave No Trace

The phrase and theme of Leave No Trace are widely recognized. The existence of the Leave No Trace organization is not well known. Using the Leave No Trace theme and concepts fosters quick recognition and adds credibility to the educational program. One potential concern was raised. Those familiar with Leave No Trace recognize its back country legacy. Some were concerned that back country principles would be transplanted to front country areas without recognition of legitimate differences.

Program Name

Two different versions of the program name were tested:
Do the Wild Thing: Leave No Trace on Open SpaceLeave No Trace on Open Space

Opinions were mixed as to which was preferred. Overall, "Do the Wild Thing" was viewed as being more positive, having more energy, being more fun and being more catchy. Others considered the "wild thing" as connoting wild, irresponsible behavior, a theme that is inappropriate and inconsistent with the program’s message and philosophy. On its own, "Leave No Trace on Open Space" was seen as making the point, but in a boring, fairly negative way.

Mascot

Three representations of a Coyote Bob mascot (symbol, icon, spokesperson) were tested. The three variations are referred to here as: the accurate drawing, the whistler, and the hiker. The whistler received many negative comments. The impression that the character is oblivious to its surroundings made it a poor choice to represent the program. There was a feeling that the whistler character was irresponsible. While the accurate line drawing was described in many positive ways, people seemed to be able to relate best, on a personal level, to the more "humanized" coyote hiker.

Message styles and overall program support

The persuasiveness of a message is not only a function of the argument (what you say), but it is also a function of the message style (how you say it). Several message styles were reviewed in order to assess which style participants felt would be the most appropriate and the most effective.

One set of alternatives presented a direct, formal style compared to a more relaxed informal style The relaxed style was more comfortable and friendly for many. The direct style came across as dry and directive.

Participants were asked to identify effective ways for them to receive the program message. Most participants felt that a variety of methods were viable, and that different media would be appropriate for different types of messages. Details are provided in the report.

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5. OUTREACH PROGRAM

Research literature and focus group results were used to design the Leave No Trace On Open Space program. A summary of related research is included below, followed by how the research and focus group results were used in designing the program.

5.1 Related Research

Using education and persuasion to influence a visitor's behavior is an important management tool, especially with visitor's "uninformed" and "unskilled actions" (Roggenbeck, J. W., 1992). Research results show that personal contacts, reinforced through other mechanisms such as brochures, are the most effective at behavioral change. When studying litter and tree scarring behavior, Oliver et al. (1985) found that a brochure and personal contact was much more effective that just a brochure (littering 67% versus 41%, tree damage 21% versus 4%). Simple verbal appeals have shown to increase the likelihood visitors would pack out other's trash (Muth and Clark, 1978). Precise requests are more effective at getting people to pick up trash (Horsley, 1988). Shifting camping away from a heavily impacted meadow was most successful when a personal contact at the meadow (33 % camped in meadow) or a brochure at the trailhead (44%) than with no intervention (62%) (Roggenbeck and Berrier, 1982; Lucas, 1981). Based on this information, educational appeals were designed to be clear and to support personalized trailhead contacts. The personal contacts were directly supported by a brochure, an information board poster, and signs. Because it is important to instill a leave no trace ethic, the "central route" of persuasion was used. The central route requires that: ...the recipient must have high motivation to pay attention to the message content, be able to process the information, accept the message arguments, and have the skills to act on these arguments. Many characteristics of the recipient (e.g., personal involvement with the park, prior experience, prior knowledge, and the amount of personal responsibility for actions in the park), of the message (e.g., personal relevance of content, strength of argument, message complexity, and message repetition), of the medium or channel of message transfer (e.g., the written word, audio or video presentations), and of the situation (e.g., timing of message transfer and distractions of the communication setting) influence the success of this kind of ideal learning (Roggenbeck, J. W., 1992) .By using the central route, the objective is to shift visitor attitudes and beliefs, behavioral intent, and ultimately behavior. The other route of persuasion, the peripheral route, is often used when elaboration is low and people rely on simple decision rules when making decisions. This approach usually results in only temporary behavioral change. There are two weaknesses in using the central route in this application that were acknowledged and addressed when designing the outreach program. First, in many circumstances the attention and elaboration on the issue is limited because trailheads are often busy and visitors are focused on their outdoor activity. Second, the target audience, frequent visitors, have a fairly high level of knowledge about the area and minimum impact ideas. Visitors with higher knowledge and experience levels, as opposed to the first time or low knowledge visitor, are more likely to reject weak arguments when they compare the argument to their base of knowledge (Manfredo, M. J. & Bright, A. D., 1991).To address these problems, the education program was designed around personal contacts that help to get the visitor's undivided attention. Other communication channels were designed to support this contact. In addition, outreach materials were designed to be fun, attractive, and to support the good feeling of "being out" so that the visitor was more likely to spend some time reading the material. To address the strength of argument issue, arguments were tested on a focus group and strengthened and refined based on feedback from frequent visitors. Their are five generally accepted factors involved in communication: source, receiver, message, communication channels, and situation. How these factors were addressed are briefly described below:Source
Conducted trailhead contacts with staff and volunteers in informal uniforms. Listed the supporting environmental and recreational groups prominently on the brochure. Receiver
Talked to visitors at the trailhead before they began their activity so they would be more receptive to a short conversation that would make them think more about the ideas. Message
Selected the strongest arguments from the focus group results. Designed the principles, their wording, the brochure, and signs to be fun.All channels of communication repeated the same message and principles. Medium or Channel
Designed the program around the trailhead contact and brochure hand-out. Reinforced the personal contact with other mediums using the same themes and look. Produced signs that were "cut outs" of the icon representing the principle and were changed periodically to maintain interest. Situation
Contacted people at the trailhead so that visitor's focus was on the message and not on distractions caused by activity at the trailhead. Used a friendly approach to help mitigate any "forewarning" concerns. Forewarning occurs when someone becomes less receptive to a message when they know they are about to hear a message or pitch.

5.2 Communication Program

Based on research and focus groups results the Leave No Trace on Open Space message was revised, a principal added (share the trail), additional information on reducing impacts to wildlife included, and the following outreach channels selected. The wording for the refined principals were: manage you dog, pick up poop, trash your trash, leave it as you find it, stick to trail, and share our trails. Principles are meant to be punchy, fun, and memorable. As a result, the principals are short and three words (six words in one instance).

Field Contact

Trailhead contacts were the keystone of the education effort. As discussed above, research shows that personal contacts, supported by other communication channels, is the most effective persuasion strategy. Public Information Coordinators and volunteer Trailhead Guides made the educational contacts. A training session was held and a certificate awarded for successful completion of the training (Certificate - Attachment B). A brochure was designed to reinforce the contact, as well as for general distribution.

Brochure

The brochure was designed to be fun, informal, and provide more detail. The preference among focus group attendees was for a fun, catchy look (Brochure - Attachment C). The brochure provides the most thorough elaboration of the reasoning behind the principals. Still, because people will only give a limited amount of attention to the brochure, no more that three paragraphs for each principal were included. An inverted paragraph writing approach was used so the most important information was included in the first paragraph. Concepts not clearly understood by focus group participants were placed in the second and third paragraphs. To lend credibility to the effort and make it more effective, source cues were provided by prominently listing environmental and recreational group sponsors. Information Board poster was designed with the same theme as the brochures for trailhead information boards. Research has shown the limitation of information boards in message retention (Cole 1997; Cole 1998) (Poster - Attachment D).

To address these deficiencies two strategies were used: (1) because minimum impact practices on information boards likely receives limited attention and resulting knowledge retention, only the first paragraph of explanation was provided for each of the principles (Cole, 1997) and (2) signs were used to augment information board messages.

Signs

Signs were designed to communicate and reinforce principals when visitors were "on the fly" and reinforce trailhead posters. The Cole studies documented that there is limited retention of information board information. In fact, no more than two minimum-impact messages were retained, regardless of whether 2 through 8 messages were listed. The study also highlighted that less attention given to information boards by equestrians than hikers (Cole, 1997; Cole, 1998). This lack of attention to information board message by equestrians probably also applies to runners and mountain bikers, who from observation are less likely to stop to read a sign than hikers. Six strategies were employed to make the signs more memorable: (1) each sign only described one principle, (2) each sign was a "cut-out" in the distinct shape of the "cartoon" icons reinforcing the same icon on the posters and brochures, (3) text was brief and reasonably large, (4) signs were mounted separately from the information board in a conspicuous location, (5) signs were changed periodically to keep them "fresh," and (6) signs addressing management issues of interest at specific trailheads received more time at the trailhead.

Media

News releases and reporter contacts targeted sections of the local newspaper of interest to frequent recreationists as suggested by focus group participants. Coverage included a prominent article with color photograph on the "Get Out" feature page, a short article in a weekly paper, a letter to the editor by a volunteer Trail Guide, and an article in a monthly sports tabloid ("Get Out" article - Attachment E).

Community Access Video Spot

A three minute video spot was created to run throughout the day on the local community access channel. The spot ran six times per week through September 1998. To increase effectiveness, desired behaviors were modeled on screen, while the narrator explained the principle and its reasoning. Viewership is greater than many community access channels because Channel 8 is located between frequently viewed network channels of 7 and 9. As with mail, this communication technique was targeted at opinion leaders, and secondarily frequent visitors.

Mail

Identified opinion leaders (about 300) received two mailings: a kick-off announcement invitation and an invitation to Leave No Trace on Open Space interpretive talks (Mailing - Attachment F).

Interpretive Talks

An interpretive talk was held. Turnout was low with four people attending. Two Girl Scout and a class presentation were also given.

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6. CONTACT LOG RESULTS

6.1 Study objectives

The focus contact log objectives were to:

1. Track contacts and contact time for future trailhead education efforts.

2. Gauge awareness of the leave not trace idea.

3. Evaluate visitor interest in leave no trace ethic.

4. See if interest and awareness might be related.

Information recorded on the log form was designed to be simple and quick for two reasons. First, the primary purpose of the field contact was to educate visitors about Leave No Trace on Open Space principals. Only after the educational contact was complete was the log filled out. Second, often there was so much activity at the trailhead, it was difficult to record information.

6.2 Methods

Sampling

Public Information Coordinators and volunteer Trail Guides contacted visitors at five locations--four trail heads with parking lots and one major access point without a parking lot. These accesses were selected for three reasons. First, they were in the pilot area. Second, people in the focus group said they preferred to be stopped at trailheads before they began their activity. Third, these locations had high to moderate levels of visitation which enabled staff to contact the most visitors in the available time. When the trailhead was busy it was impossible to contact all visitors, but once a contact was finished the next available person was contacted.

Extra effort was made to contact runners and bikers because they are generally more reluctant to stop. Educators were required to attend a four hour training session prior to making field contacts.

Contacts took place between August 29, 1998 and October 14, 1998. Fall (after spring) is the second busiest season for Open Space (Manfredo, 1993). Shifts were scheduled so that visitors were contacted in the morning, mid-day, and early evening times when trailheads were busy. Shifts were also scheduled for week days and weekends. Shifts were two hours long.

Procedure

Log sheets were produced to standardize results. When an educator started their shift they recorded their name, location, date, and start time. At the end of the shift they recorded their finish time. Once a contact was completed the educator recorded the information on the log (Log - Attachment G). An instruction sheet described which questions to ask, information to record, and how to include the information on the contact log (Instruction sheet - Attachment H).

6.3 Results Objective 1: Track Contacts and Contact Time for Future Trailhead Education Efforts

A total of 1,700 contacts were made: 1,450 were analyzed because 170 were recontacts, and about 80 contacts were not recorded correctly. A total of 51 shifts were worked for a total of 91 hours (the goal was 120 hours and 3,000 contacts). Each shift lasted 1.8 hours and 17.8 visitors were contacted per hour.
Productivity Summary

Measure

Qty

Number of Shifts
51

Average Number of Hours per Shift
1.8

Total Number of Hours Worked
91

Number of Days Worked
33

Number of Educators
13

Average Number of Shifts per Educator (Median = 6.5)
4

Average Group Size
1.5

Average Number of Groups Contacted
11.5

Average Number of People Contacted per Hour Worked
17.8
All mean averages. Group size didn't vary much among trailheads.

Size of Groups

Bobolink

Cottonwood

Dry Creek

Mt. Sanitas

South Boulder Creek

Total Sites

#

%

#

%

#

%

#

%

#

%

#

%

1

289

59%

69

62%

102

71%

56

67%

57

61%

573

62%

2

150

30%

32

29%

34

24%

21

25%

26

28%

263

28%

3

31

6%

6

5%

5

3%

4

5%

6

6%

52

6%

4

16

3%

0

0%

3

2%

2

2%

2

2%

23

2%

5

4

1%

3

3%

0

0%

0

0%

1

1%

8

1%

6 or more

4

1%

1

1%

0

0%

1

1%

1

1%

7

1%

Total Groups

494

100%

111

100%

144

100%

84

100%

93

100%

926

100%

Ave. Group Size

1.6

1.6

1.4

1.5

1.6

1.6
The best time of day to contact visitors varies by trailhead, but the average contacts per hour where: morning - 13, midday - 10, and afternoon - 12. (The overlap from 10:30 to is due to the difficulty in placing overlapping shifts in one or the other time frame. To ease computation, shifts in two time periods were placed in the time period where most of the shift occurred. The South Boulder Creek contact location is on the South Boulder Creek Trail on the south side of South Boulder Road.)
Average Group Contacts per Hour

Portion of Day

Bobolink

Cotton

wood

Dry Creek

Mount Sanitas

South Boulder Creek

All

Morning (7:30 am to noon)

16.4

10.0

7.7

N/A

12.8

12.8

Midday (10:30 am to 3:00 p.m.)

11.2

8.9

8.5

7.5

N/A

9.7

Afternoon (2:00 to 7:00 p.m.)

9.5

11.0

13.8

10.7

19.3

12.0

All

12.7

10.0

10.6

9.1

16.0

11.6

The busy Bobolink Trailhead had the most contacts with 56%. All other locations had less than 15%. A 1993 visitation study documented over a quarter million visits along South Boulder Creek Trail. Bobolink is the major trailhead for this trail. Visitation has likely increased along the trail. Over 60% of contacts where with either dog walkers or hikers. Caution should be used, however, with dog walker and hiker figures. The dog walker figure may be high and the hiker number low. This is because it was often difficult to tell if, for example, a group of three people arrived with two off-leash dogs, if all three were dog walkers. When unsure, all three were recorded as dog walkers.

Dry Creek had twice the percentage of dog walkers when compared to any other trailhead at 78%. Bobolink had half as many dog walkers, and Mount Sanitas, Cottonwood, and South Boulder Creek fewer yet. (South Boulder Creek is adjacent to a no dogs area).

Objective 2: Gauge Awareness of the Leave No Trace (LNT) Idea

About one third of visitors were aware of the leave no trace idea, leaving room for improvement through improvement.

Objective 3: Evaluate Visitor Interest in Leave No Trace Ethics

There are two indicators of interest recorded on the log: (1) the educators impression of the visitors interest, and (2) whether the visitor took a Leave No Trace on Open Space brochure. These two indicators provide a general gauge of receptivity and openness toward the program. They also allow comparisons among activities and trailheads so the program can be better understood and refined.Two precautionary actions were taken to reduce any difference in the educator's impressions of interest level. First, a written scale was used to help standardize answers (see Attachment F). Second, educators worked different locations and times to average out any bias. Interest in a leave no trace ethic were perceived as high, suggesting a receptivity to the educational program and the potential to change behaviors. Only 1/5 of visitors were not interested, 2/5 showing mild interest, and 2/5 being either interested or very interested. Interest was greatest at Dry Creek and Mount Sanitas with just under 50% showing interest; Bobolink, South Boulder Creek and Cottonwood came in just under 40%. The "other" category showed the greatest interest with 73%, although this group had only 11 group contacts. Hikers and dog walkers showed interest with 40% of groups interested, followed by bikers (32%), and joggers (28%).The second indicator of interest is the 82% of visitors who accepted the Leave No Trace on Open Space brochure. Visitors took the brochure at Dry Creek 89% of the time, Bobolink and Mount Sanitas 86%, South Boulder Creek 73%, and Cottonwood 65%. Cottonwood's lower acceptance rate may be related to the high number of bike commuters who are less likely to stop. Dog walkers took the material 85% of the time, hikers 83%, bikers 78%, joggers 74%, and equestrians 67%. It is more difficult to get bike riders, joggers, and equestrians to stop, likely accounting for the lower percentages for those activities. This could also explain the lower percentage.It is worth noting that dog walkers and visitors at Dry Creek accepted the brochure more that visitors in the other categories. The education program was conducted at the same time that trails planning and dog management was a major issue at Dry Creek.

Objective 4:

See If Interest and Awareness Might Be Related

Visitors more aware of leave no trace ethics were less likely to accept the materials (92% verses 74%). This may indicate that it may be more difficult to educate more knowledgeable people about new leave no trace concepts. Research literature suggests that it is more difficult to influence behavior of people in areas when the audience's knowledge level about a subject is high.

Conclusions

Educating visitors at trailheads is a long-term, incremental, persistent proposition. On average 18 people were contacted an hour. With 91 hours of contact, 1,700 contacts were made. Productivity at busy times in the morning, midday, afternoon did not vary much, although it varied some among trailheads. Hikers and dog walkers were the most frequently contacted activity groups accounting for 30% of contacts each. Dry Creek had twice the percentage of dog walkers than any other trailhead. Only one third of the visitors contacted were aware of the leave no trace idea, leaving room for improvement in awareness. Based on visitors' willingness to accept materials and their level of interest, it is likely the visitors are at least open to leave no trace messages, and may be willing to change behavior based on this new information. Visitors who were aware of leave no trace ethics were somewhat less likely to accept a brochure, possibly indicating difficulty in educating visitors already familiar with leave no trace with newer concepts, such as orange peals not being very biodegradable. This greater difficulty educating people familiar with a subject is consistent with research literature.

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7. PROGRAM ASSESSMENT SURVEY

7.1 Study Objectives

The survey had three objectives related to measuring the effectiveness of the pilot project education campaign: 1. Increase in knowledge
2. Increase in program awareness
3. Most effective outreach mechanisms7.2 Methods The final phase of the program was an intercept survey administered at the same four trailheads where personal contacts were made (Survey instrument - Attachment G). The survey was conducted over a six-week period from January to mid February 1998 by staff and volunteers. Over 630 randomly selected participants were surveyed—320 had heard and 313 had not heard of the program--with wide ranges in age, education level, activity, and frequency of use. The margin of error for 633 is +/- .04 and when 313 or 320 are used independently it is +/- .056.7.3 Results
Knowledge was gauged with a five question series of true and false questions about the information found in the brochures, posters, and signs and delivered through staff trailhead contacts and programs. Visitors were then asked if they had heard of the LNTOS program. If they had not, they skipped to the demographic questions for comparison. Those aware of the program were asked to rate the effectiveness of seven outreach mechanisms on changing behavior on a scale of '1-5', '1' being highly effective, and '5' being highly ineffective. Behavioral intent was measured by asking the participants to rate their likelihood of practicing the 6 principles. The survey solicited the public's input and suggestions to improve the program and concluded with a series of demographic questions.
Compared to the log results, there was at least a 17% increase in awareness of leave no trace in the pilot area after the outreach program. When first contacted only 33% of visitors knew about the general concept of leave no trace based on log results. This compares to 50% awareness of the more specific Leave No Trace on Open Space program on the follow-up survey.
Survey results showed dog walkers to be more aware of the LNTOS program (65%), frequent visitors (3+/wk) had a 60% awareness of the program. Those visitors 65 years and older were 54% aware of the program. 54% of those with some college had a higher awareness of the program than other visitor education levels.
People who visited the pilot area were mostly female (56%), 25 - 44 years of age (54%), and well educated (74% college degree or advanced degree). Dog walking (36%) and hiking (26%) were their primary activities, with running (20%) and biking (16%) close behind. They are an active bunch: 58% visited Open Space three plus times a week, while only 4% visited less than once a month.
Bobolink Trailhead accounted for 58% of the contacts (similar to the contact logs), Dry Creek had 19%, Cottonwood 16%, and South Boulder Creek Trail south of South Boulder Road 7%. Zip codes help identify generally where people come from: 71% Boulder (43% from the pilot area) and 15% Lafayette/Louisville.
About 25% of the participants aware of the LNTOS program were contacted at the trailhead, 20% learned of the program through the information boards, 15% through newspapers, 10% by signs, 9% by word of mouth, and 9% learned of the program in other ways. The sign percentage is artificially low because the signs were placed mid-way through the program.
Most people thought the trailhead contacts were most effective (55% highly effective), followed by signs (32%), word of mouth (26%), information boards (24%), newspaper (13%), mailing (18%) and Channel 8 (8%).
Knowledge levels of visitors who had heard of the program were higher than knowledge levels of visitors who had not heard of the program. Increasing knowledge levels, in addition to changing behavior, was a primary objective of the program. Based on an index of a five true/false knowledge questions, there was a statistically significant knowledge difference between those who had heard about the program and those who had not. A mean of 3.43 correct responses was found for those aware of the program, compared to 2.9 correct responses for those not aware of the program.
Results for each true/false knowledge question are listed below. Those who were aware of the LNTOS program are listed first, followed by those who were not aware. An * denotes statistically significant difference between the two: orange peels taking several years to decompose--66% to 47%*, dog poop increasing nitrogen thus favoring weeds--36% to 30%, collecting leaves is OK--93% to 83%*, walking through mud-- 89% to 87%, and trail activity impacts birds 100 yards from trail--60% to 51%*.
Increased knowledge levels of visitors who had heard of the program can be demonstrated another way. A greater percentage of visitors who had heard of the LNTOS program could correctly answer at least four of the five knowledge questions, than visitors who had not heard of the program. Of those who had heard of the program, 52% answered at least four questions correctly, compared to 37% of those who had not heard of the program. Runners had 51% with four or more answers correct, bikers 46%, hikers 43%, and dog walkers 41%.
Only people who had heard of the program were asked about their intent to change behavior, so a comparative analysis could not be made. Intuitively, given the increase in program awareness and knowledge level, an increase in behavioral intent may have occurred as well. For those who heard of the program, 95% said they were very likely to practice trash your trash principle, 90% leave it as you find it, 88% share the trail, 86% manage your dog, 79% stick to trail, 78% pick up poop.
Program improvement suggestions made in an open-ended question were primarily for increased education and

outreach efforts with 34%. Enforcement and patrol efforts accounted for 14% of the suggestions and 15% were related to dog management.
Trailhead contacts (77 % effective), signs (65%), information boards (59%), and word of mouth (50%) were those mechanisms thought to be most effective by the 320 people who had heard of the program. Newspapers (37%) and Channel 8 (17%) were thought to be less effective.

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8. Recommendations for System

Based on the success of the pilot program the Leave No Trace on Open Space program should be implemented throughout Open Space. Pilot program research shows that: 1) awareness of Leave No Trace on Open Space program increased at least 17% in the pilot area, 2) knowledge levels of those who had heard of the program were significantly higher than those who had not, and 3) there is a good chance that some behavioral change took place. Minimum impact education is a fundamental management tool. The Leave No Trace on Open Space program, albeit in need of refinement, has proven effective. A cautionary note: Because values, beliefs, and attitudes are so deeply held and the education process is so complex, marketing research has shown that a very successful program shifts only 5% of a target audience's behavior (Mendelsohn, H. 1973).

The following education process illustrates the complexity and sequential nature of changing behavior: 1) someone needs to be exposed to the information, 2) then they need to attend to the new information, 3) they need to be open and receptive to thinking about it, 4) then it is interpreted so it makes sense to them both through thought and feeling, 5) the information is then compared and integrated (or not) into a person's knowledge and experiences, and finally, if all these things occur, 6) an action takes place.

This information illustrates three things:

1) Education is incremental and it takes concerted and prolonged effort to change attitudes, let alone behavior. One has to only look at the littering campaigns to understand the generational timeframes required to shift predominate attitudes.

2) Education is most effective at addressing uninformed and unskilled actions and much less effective at addressing uncaring or illegal actions.

3) Education does not replace the need for other visitor management actions that may be required in an area to maintain recreational experiences and to protect wildlife.

Education Approach

Because of the objective of instilling a leave no trace ethic, the "Central Route of Persuasion" will again be used. This approach uses information and logic to create long lasting change in attitudes and behavior. It also requires strong arguments, and that the receiver of the message be attentive, receptive, and willing to integrate the information with what they already know--something that is difficult to do. It is a "long-haul" proposition. In the "Peripheral Route of Persuasion" decision rules or superficial clues to change behavior (e.g. appearance) and change is usually short lived (just think of a beer commercial).

Source factors

Trailhead contacts by Public Information Coordinators and volunteer Trail Guides, identified by their Open Space shirts, will remain central to the program. Contacts will be upbeat with an interest expressed in the visitor's activity. Interest groups will continue to be featured prominently on materials. An endorsement campaign by prominent recreationalists will be considered. Modeling behavior has been proven to be one of the most effective persuasion techniques. While staff may already perform low-impact practices, they will be asked to read the materials and be sure to model the behavior.

Receiver factors

Trailhead contacts will continue to be made, better ensuring that visitors take time to think about concepts, evaluate them, and hopefully incorporate them into their actions. The representative can tailor the discussion directly to the visitor's needs. The program will continue to focus on the frequent visitors because of their inordinate amount of use, although research indicates that behavior change is more difficult among people with higher knowledge levels because they have a variety of experiences to compare to what is recommended. Because it is important that opinion leaders know about the program, they will continue to be a secondary target audience for the program.

Message factors

Language will be refined in light of research results. With all text, the strongest arguments will be used. The text will concentrate on what people do not know or are not skilled at (trail and off trail effects, orange peels, dog poop).

Channel factors

Program "look" - The program will continue with the "fun" graphic look with icons for each principle.

Trailhead contacts - Based on the assessment survey and other research, personal contacts will again be the focal point of the program, with brochures and signs used for reinforcement.

Signs - Signs will continue to incorporate the "icon" from the brochure, cut-out, single principle look. Signs will be continue to be rotated based on area needs. Placement of the signs will continue to be at trailheads separate from information boards. A more permanent way to attach these signs will be used.

Information boards - Posters will again be used in information boards. A large banner reading "Please take the time to read these messages" will be placed across the top of the board to increase attention to all the materials placed on the board (as based on the Cole information board research results).

News coverage - News coverage will be sought. This includes two articles in the Daily Camera Get Out! Section, and one article in the other Boulder papers.

Video – A short Channel 8 video will be produced with a new voice over using available footage. The logo and icons will be integrated into the program. The video will be frequently run to fill in small airtime openings to reach opinion leaders.

Interpretive programs – Instead of specific Leave No Trace on Open Space programs, which were poorly attended, germane or the high priority principles will be incorporated into all interpretive/educational programs.

Mail – A kick-off announcement and a program announcement will be mailed to opinion leaders.

Research --Finally, a research program to further measure success of the program will be established. This will include improved contact log categories and a survey (s) to further gauge effectiveness and improve the program. The survey will be designed to gauge knowledge gain, behavioral intent change, and refinement of the educational factors listed above.

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10. Project Timeline

Message and principle development February 7 - June 16 1998

Focus group July 7 - 8 1998

Education program development July 14 - August 28 1998

Trailhead educator training August 20 1998

Education program/contact logs August 29 - October 14 1998

Survey pre-test November 30 1998

Survey December 1 - February 13 1998 - 1999

Survey analysis February - April 1999

Program development April - June 1999

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